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SOME NEW WILLOWS OF EASTERN AMERICA.

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Recent explorations of the eastern portion of the Province of Quebec have brought to light many willows which have hitherto been unknown in eastern America. Some of these shrubs, such as *Salix pseudomyrsinites* Anders., *S. Barclayi* Anders., and *S. fuscescens* Anders., have been previously known only from the northwestern Provinces or from Alaska; the unique *S. Richardsoni* Hook., var. *Macouniana* Bebb has been known only from Hudson Bay and northern Labrador; while some others it has been impossible to identify with any described species or varieties.

The most abundant of these undescribed willows are two large shrubs or small trees which abound on the terraces and banks of the St. Lawrence at least from Matane to the River Ste. Anne des Monts, and probably beyond, and for several miles inland in the valley of that river. One of these trees, which in its best development is about 15 feet high, with wide-spreading branches, has the largest leaves known to the writer in any member of the *Diandrae*, the mature blades often reaching a length of 5 or 6 inches. This handsome large species may appropriately be called

Salix **laurentiana** n. sp. Frutex altus vel arbor mediocris, ramis crassis junioribus canescento-tomentosis; foliis oblongis vel oblongo-obovatis acutis vel breviter acuminatis junioribus dense albo-pubescentibus, demum supra glabris viridibus lucidis subtus glaucescentibus 6–14 cm. longis 3–4.5 cm. latis subintegris vel leviter crenatis, petiolis gracilibus circa 1.5 cm. longis tomentosis; stipulis late ovatis deciduis; amentis gracilibus pedunculatis foliis parvis 3–5 suffultis patulis, femineis densifloris fructiferis 4–9 cm. longis 1 cm. crassis; squamis oblongis obtusis fuscis longe pilosis; capsulis conico-subulatis obtusis canescento-tomentosis 5–6 mm. longis pedicellatis, pedi-

cello nectarium triplo superante; stylo brevissimo, stigmatibus bifidis.

Large shrub or small widely branching tree, 2–5 m. high; branchlets coarse, canescent-tomentose, the pubescence slightly lustrous; leaves oblong to oblong-obovate, at first silky-tomentose on both surfaces, in maturity bright green and glabrate above, glabrate and glaucous beneath, 6–14 cm. long, 3–4.5 cm. broad, subentire or shallowly crenate, acute or short-acuminate, rounded at base to the tomentose petiole (about 1.5 cm. long); stipules round-ovate, deciduous; aments borne upon short leafy branches, the pistillate dense, on canescent peduncles, 4–9 cm. long, about 1 cm. thick; scales oblong, obtuse, dark brown, long-pilose; capsule conic-subulate, blunt, canescent-tomentose, 5–6 mm. long; pedicel 1–2 mm. long, thrice as long as the nectary; style 0.5 mm. long, the stigmas deeply cleft.— QUEBEC, abundant on terraces and banks of the St. Lawrence River from Matane, Matane Co., to Ruisseau Castor, Gaspé Co., and probably eastward. Type material: in fruit, Méchins, Gaspé Co., July 12, 1906 (*Fernald & Collins*, no. 202); in mature foliage, calcareous-sandstone sea-cliffs, Tourelle, Gaspé Co., August 19–21, 1905 (*Fernald & Collins*).

A handsome and very characteristic large-leaved shrub or small tree, suggesting in its foliage and tomentose branchlets *S. amplifolia* Coville, of Alaska, which has slightly smaller leaves, no stipules, thicker aments (1.5–2 cm. in thickness), the ovary and capsule smooth, and the style 3–4 mm. long. From the eastern *S. glaucophylla*, which abounds along the rivers of northern Maine, New Brunswick and Quebec, *S. laurentiana* is, likewise, immediately distinguished by its tomentose capsules, as well as the aments terminating leafy twigs instead of being sessile or subsessile upon the old wood.

The other undescribed willow which is associated on the banks of the lower St. Lawrence with *S. laurentiana*, *S. pellita* Anders., *S. lucida*, var. *intonsa* Fernald, and *S. rostrata* Richardson, has a wider distribution than *S. laurentiana*, for it has been observed in abundance up the river from Matane as far as St. Fabien in Rimouski County and it doubtless extends further west. This large shrub or small tree, sometimes 20 feet high with trunks 6 inches in diameter, is clearly an extreme variation of the common *S. rostrata*. In the typical form of the species as well as in such variations as I find described the leaves are more or less rugose and comparatively small, the mature pedicels are from 3 to 5 mm. long, and the capsules 5 to 9 mm. long. The larger extreme of the species from the lower St. Lawrence may be called

SALIX ROSTRATA Richardson, var. **luxurians** n. var. Arbor 2–6 m. alta, trunce 1–1.5 dm. crasso; foliis planis non rugosis 6–10 cm. longis; amentis femineis 2.5–3 cm. crassis, pedicellis 5–8.5 cm. longis; capsulis 9–12 mm. longis.

Tree 2–6 m. high, the larger trunks 1–1.5 dm. in diameter, with the nearly plane scarcely rugose leaves becoming 1 dm. long in maturity; mature pistillate aments very large, 2.5–3 cm. thick; pedicels 5–8.5 mm. long; capsules 9–12 mm. long.— QUEBEC, abundant on banks of the St. Lawrence from Rimouski Co. to Gaspé Co. Type material: limestone ledges, Bic., July 4–6, 1906 (*Fernald & Collins*, nos. 208, 495).

Along the gravelly half-inundated margin of the River Ste. Anne des Monts occurs an unusually attractive little shrub, its slender smooth branches rarely more than 2 or 3 feet high and its short oblong or suborbicular dentate leaves suggesting to the casual observer the foliage of the common *Amelanchier spicata* (Lam.) C. Koch. (*A. rotundifolia* Roem.) of the region, rather than that of any of our willows. Prolonged study fails to show any American willow to which it is nearly related, but in foliage as well as in its sessile aments the shrub very strongly suggests the little known Siberian *Salix pyrolaefolia* Ledeb. as shown in Ledebour's beautiful plate. From that unique species the shrub of the Ste. Anne River differs in several important characters enumerated below, and it seems sufficiently distinct to merit the name

SALIX **obtusata** n. sp. Frutex parvus, ramis gracilibus castaneis glaberrimis; foliis oblongis vel terminalibus suborbiculatis 2–5 cm. longis 1–3 cm. latis dentato-serratis apice rotundatis basi rotundatis vel subcordatis junioribus arachnoideis tenuissimis pellucidis purpurascentibus demum coriaceis glabris supra viridibus subtus pallidioribus, petiolis gracilibus 5–12 mm. longis; stipulis cordatis persistentibus majoribus 5 mm. longis obscure glanduloso-dentatis; amentis sessilibus, femineis 5–20 mm. longis; squamis oblongo-ovatis obtusis subfuscis laxe villosis; capsulis glabris conico-subulatis rufescentibus vel flavescentibus 2–3 mm. longis breviter pedicellatis, pedicello nectarium valde superante; stylo parvo, stigmatibus minimus bifidis.

Low slender shrub (0.5–1 m. high): branchlets slender, glossy brown, glabrous: leaves oblong to suborbicular, 2–5 cm. long, 1–3 cm. broad, closely dentate-serrate, rounded or subcordate at base, rounded at apex, glabrous, or the youngest arachnoid-tomentose, at first thin and purple-tinged; later coriaceous, bright green above, slightly glaucous beneath; petiole slender, 5–12 mm. long: stipules cordate, persistent, the largest about 5 mm. long, obscurely glandular-

dentate: aments sessile upon the old wood, the pistillate short-cylindric, 0.5–2 cm. long: scales oblong-obovate, obtuse, brownish, loosely villous: capsule glabrous, conic-subulate, reddish or yellowish, 2–3 mm. long: pedicel 0.5 mm. long, much exceeding the very short nectary: style very short, the stigmas bifid; staminate aments not seen.— QUEBEC, inundated gravelly bars and beaches, River Ste. Anne des Monts, fruit July 15, 1906, mature foliage August 16, 1906 (*Fernald & Collins*, nos. 203, 203a).

Closely allied to and strongly simulating the Siberian *S. pyrolaefolia* Ledeb. but differing in its more shallowly toothed leaves, shorter sessile aments and very short style. The type specimens were collected from characteristic low shrubs associated with a number of other willows — *S. cordata*, *S. pellita*, *S. glaucophylla*, &c.— at the frequently inundated margins of a group of alluvial islands near the head of the Grand Rapids of the River Ste. Anne des Monts.

Salix fuscescens Anders., hitherto known only from northern and western Alaska and the adjacent coast of Siberia, is abundant in bogs on the serpentine tableland of Mt. Albert. It is a very attractive creeping shrub, in foliage and other characters strongly suggesting *S. pedicellaris* Pursh of our northern temperate regions (*S. myrtilloides* of American authors, not L.). From the lowland species, *S. fuscescens* is quickly distinguished by its usually obovate leaves, the more pubescent scales of the aments, the very short thickish pedicels (barely exceeding the scales), the long subulate nectary which is usually half as long as the pedicel, and the definite though short style. As stated, this attractive species is abundant in the bogs of Mt. Albert, where it is associated with numerous other plants typical of western and northern Alaska and adjacent Siberia — *Eriophorum Chamissonis* C. A. Meyer, *Conioselinum Gmelini* (C. & S.) Coulter & Rose, *Festuca altaica* Trin., &c.,— and although many colonies have the capsules quite glabrous as in the type of the species, others occupying extensive areas of bog, have the capsules distinctly pilose. These shrubs with pilose capsules seem otherwise identical with typical *S. fucescens* and they may be designated

SALIX FUSCESCENS Anders., var. **hebecarpa** n. var. Frutex parvus, ramis subflagelliformibus; foliis amentisque eis formae typicae similibus; capsulis pilosis.

Capsules pilose; characters otherwise as in the typical form.— QUEBEC, alpine bog, tableland of Mt. Albert, Gaspé Co., July 21, 1906 (*Fernald & Collins*, no. 207).

While studying the specimens and descriptions of Labrador willows the writer has often wondered that *Salix adenophylla* should have been described as a unique species from Labrador and that we should now know the plant only from the sand dunes of the Great Lakes. A careful study of Hooker's original description of *S. adenophylla* and of Andersson's fuller descriptions of the type material shows that the shrub of the Great Lakes can have no close affinity with *S. adenophylla* and it is here proposed as

Salix **syrticola** n. sp. Frutex altus vel mediocris laxe procumbens, ramis crassis cinereo-tomentosis vel puberulis; foliis ovatis vel late lanceolatis acuminatis cordatis vel subcordatis crebre glanduloso-serrulatis junioribus sericeo-lanatis demum firmis viridibus opacis lanatis vel glabratis 3–10 cm. longis 2–5 cm. latis, petiolis brevibus latis cinereo-pubescentibus; stipulis conspicuis foliaceis cordato-ovatis glanduloso-serrulatis petiolos valde superantibus; amentis pedunculatis foliis patulis 3–6 suffultis, masculis 2.5–4.5 cm. longis circa 1 cm. crassis, femineis 2–4.5 demum 5–10 cm. longis 1–1.5 cm. crassis; squamis oblongis fulvis valde tomentosis vel longe sericeis; capsulis conico-subulatis glabris rufescentibus 5–7 mm. longis basi rotundatis vel subcordatis pedicellatis, pedicello glabro 0.5–1 mm. longo nectarium prope triplo superante; stylo 0.5–1 mm. longo, stigmatibus vix bifidis.

Large straggling shrub: branchlets stout, cinereous-tomentose or -puberulent; leaves ovate to broadly lanceolate, acuminate, cordate or subcordate, closely glandular-serrulate, silky-lanate when young, often becoming glabrate, in maturity firm, dull green, 3–10 cm. long, 2–5 cm. broad; petioles short and broad, dilated at base, cinereous-pubescent: stipules conspicuous, foliaceous, cordate-ovate, glandular-serrulate, much exceeding the petioles: bud-scales cinereous-tomentose: aments appearing with the leaves, on leafy-bracted peduncles, the bracts 3–6, resembling the leaves; staminate aments 2.5–4.5 cm. long, about 1 cm. thick; pistillate 2–4.5, becoming in fruit 5–10 cm. long, 1–1.5 cm. thick: scales oblong, pale brown, very densely long-silky or tomentose: capsule conic-subulate, glabrous, rufescent, 5–7 mm. long, rounded or subcordate at base: pedicel glabrous, 0.5–1 mm. long, nearly twice as long as the nectary: style 0.5–1 mm. long; stigmas obscurely bifid: stamens 2, the filaments glabrous.— *S. adenophylla* Bebb, The Lens, ii. 249 (1873), and in Gray, Man. ed. 6, 485 (1890); Britton in Britton & Brown, Ill. Fl. i. 504, fig. 1203 (1896); not Hook. Fl. Bor. Am. ii. 146 (1839).— Sand dunes and beaches along the Great Lakes. A sheet in the Gray Herbarium from sandy shores of Lake Michigan, near Chicago, *H. H. Babcock*, 1880 (Bebb, Herbarium Salicum, no. 2) may serve as the type.

This handsome shrub is one of the best marked species in the group,

and apparently only through his extreme caution in characterizing new species was it allowed by Mr. Bebb to pass so long for the little known *Salix adenophylla* Hook. Hooker's species from Labrador is still known only from the original specimens and descriptions, but so many of the older and hitherto obscure northern species have recently come to light that we may confidently hope soon to understand more clearly *S. adenophylla*. At present our best information upon this species is that given in the original description by Hooker and later from the type material by Andersson. It is noteworthy that Hooker, following the system of Barratt, placed his Labradorean *S. adenophylla* immediately after *S. speciosa* and *S. Barrattiana* (two of our most remarkable willows, with the large aments chiefly sessile at the tips of the old branchlets) and not in the section with *S. cordata* to which *S. syrticola*, the shrub of the Great Lake region, is clearly related.

The original description of *S. adenophylla* gives account of little besides the leaves: "foliis ovatis basi cordatis acutis.... argute serratis serraturis elongatis glanduliferis.... stipulis ovato-cordatis grosse glanduloso-serratis"; [1] but that the elongate glanduliferous serratures were sufficient in Hooker's mind to distinguish the species is shown by his note: "I know no species like this, well marked as it is by the copious long narrow serratures to the leaves tipped with a gland, so that the leaf looks as if it were fringed with pedicellated glands." [1] This remarkable character of the foliage is sufficient, even if the habitat, Labrador, were not almost convincing, to show that Hooker's plant could not have been the same as the common sand dune shrub of the Great Lakes; and when we refer to Andersson's account [2] of the Hookerian type, we find added corroboration in the statements of other characters: "folia.... majora pollicem longa" (in *S. syrticola* the larger are a full decimeter — 4 inches — long, and the smallest examined are 3 cm. long); the fully mature fruiting ament "1½ poll. longa" (in *S. syrticola* 5–10 cm. — 2–4 inches); "squamis .... glabriusculis" (in *S. syrticola* very densely and persistently long-silky or tomentose); "pedicello cinereo" (in *S. syrticola* glabrous and straw-colored).

Gray Herbarium.

[1] Hook. Fl. Bor.-Am. ii. 146 (1839).

[2] DC. Prodr. xvi. 254 (1864).